BIPEDAL LOCOMOTION TRAINING AND PERFORMANCE EVALUATION DEVICE AND METHOD

ABSTRACT

An exercise and performance evaluation apparatus includes a revolving belt on which a subject can perform bipedal locomotion, a harness for securing the subject at a fixed position relative to the apparatus, a means for measuring the force applied by the subject to the belt, and a means for monitoring and controlling the velocity of the belt. The harnessing of the subject allows monitoring of the velocity as a function of time. An overhead harness may be used to alter the effective mass of the subject. The velocity of the belt may be controlled by a motor and brake system, where the motor may be uni-directional or bi-directional. A digital processor may be used to control the motor and/or brake as a function of the applied forces to simulate real-world or virtual world environments, allowing the operation of the device in modes such as constant-force modes, constant-load modes, constant velocity modes, sprint simulation mode, bob sled simulation mode, terminal velocity determination mode, isokinetic overspeed mode, and isotonic overspeed mode. Processing of the velocity and force as a function of time allows for the recording and analysis of data such as the maximal exertion force-velocity curve, left leg/right leg performance, force as a function of stride, etc.